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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/826,419	04/05/2001	Thomas H. Osterheld	003415	5039

7590

06/25/2002

Patent Counsel
Applied Materials, INC.
P.O. Box 450A
Santa Clara, CA 95052

EXAMINER

THOMAS, DAVID B

ART UNIT

PAPER NUMBER

3723

DATE MAILED: 06/25/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/826,419

Applicant(s)

OSTERHELD, THOMAS H.

Examiner

David B. Thomas

Art Unit

3723

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 April 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 October 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 8.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement filed May 17, 2002 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each U.S. and foreign patent; each publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. The examiner has considered each reference accessible via the office database, however Application Ser. No. 09/338,357 has not been considered as it is currently unavailable.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-4, 14-16, and 18-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Tuttle.

Tuttle discloses a CMP polishing pad having a plurality of reliefs in a main polishing surface, wherein the reliefs are disposed in a predetermined pattern as a function of pad radius. The reliefs may be depressions or through-holes in the pad (Col. 3, lines 28-30), and the reliefs have a rectangular, square, triangular or round shape (see Fig. 3). Although Tuttle is silent on the matter, the examiner respectfully contends that as broadly claimed “for determining wear” is functional language and that an operator observes the surface of a polishing pad during use in a CMP operation and determines, based upon visual changes to the surface characteristics of the pad, the

wear of the pad. The operator may determine that wear occurs to the pad by observing individual points, several points or several regions of the pad for discerning that wear is occurring at different rates.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 5-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tuttle in view of Tzeng.

Tuttle is discussed above in the rejection of Claims 1-4, 14-16, and 18-20. Tuttle discloses that a circular polishing pad may have a plurality of reliefs or depressions of various shapes or patterns and emphasizes that the pattern chosen is based upon a function of the radius of the pad to provide a constant, or nearly constant, surface contact rate to a workpiece, in order to effect improved planarity of the workpiece. Observation of the pad wear of the pad of Tuttle is limited in that it would be difficult to monitor wear of each and every depression of the pad. Tzeng discloses the claimed method for measuring wear of the thickness of a CMP pad (see Col. 2, lines 35-42; Figs. 3 and 4 and Claims 15-23 and 26-31). Tzeng performs this method of monitoring pad wear on a belt-type polishing pad rather than a circular polishing pad, however Tzeng does scan the belt from one edge to the other. Tzeng teaches that this type of pad wear monitoring in the CMP environment is desirable to minimize down time for

maintenance. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the method of monitoring pad wear [i.e. visual observation] of a pad like that of Tuttle, by providing a method of monitoring pad wear as taught by Tzeng to a pad such as Tuttle's, wherein Tzeng teaches that the in-situ sensor measures the polishing pads, uses these measurements to identify wear or uneven wear of the pad and make adjustments to the pad accordingly, wherein this method preferable to pad maintenance based upon statistical analysis rather than real-time measurements.

6. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tuttle, as rejected above in paragraph 3, in view of Hoopman et al.

Tuttle is discussed above and discloses the claimed invention except for providing a pattern based upon spiral, non-symmetrical pseudo-random, and combinations thereof. Hoopman et al discloses a CMP pad having a plurality of reliefs disposed in a predetermined pattern (the plurality of reliefs are created as a result of combining a plurality of abrasive particles in An abrasive article having sheet-like structure including a major surface extending within an imaginary plane with a plurality of individual three-dimensional abrasive composites deployed in fixed positions thereto in an array, each of the composites has abrasive particles dispersed in a binder and has a substantially precise shape and a distal end, where another imaginary plane extends parallel to and is spaced from the first imaginary plane and intersects the lowest distal end among the composites, wherein any imaginary line drawn within the latter-mentioned imaginary plane in the direction(s) of intended use intersect at least one cross-section among the abrasive composites in the array), wherein the

predetermined pattern can be used to determine (by observation) wear of at least one region of the pad. Hoopman et al teaches that the pattern or arrangement of the abrasives may be grouped in subarrays wherein different patterns are chosen (see Col. 7, lines 13-56) in order to achieve desirable polishing in different environments. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the predetermined pattern of the polishing pad of Tuttle, as Hoopman et al teaches that it would desirable to change the pattern in order to achieve a particular desired result based upon the environment in which the polishing pad is to be implemented.

Response to Arguments

7. Applicant's arguments with respect to claims 1-20 have been considered but are moot in view of the new ground(s) of rejection.

8. The examiner respectfully contends that the predetermined pattern of a plurality of reliefs for measuring wear of a pad, as claimed functionally, and the method for measuring wear does not read over the prior art of record. However, the examiner suggests that an amendment to particularly define how the recesses, and the particular positioning thereof, as well as the means for measuring and how the recesses are instrumental to the measuring and monitoring of wear rather than merely providing recesses to distribute slurry, may be substantial enough to overcome the prior art of record.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Amsden et al., Bennett et al. (2 refs.), Broido, Chen et al.,

Gagne, Myers, Osterheld et al. (2 refs.), Robinson et al. (6,277,015), and Walker each disclose a patterned abrading apparatus wherein the pattern of groves or depressions is utilized to carry the slurry for improved polishing.

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David B. Thomas whose telephone number is (703) 308-4250. The examiner can normally be reached on 8:00-6:30 M-TH.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph J. Hail can be reached on (703) 308-2687. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-9835 for regular communications and (703) 305-9835 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1148.

DBT

dbt

June 14, 2002



Joseph J. Hail, III
Supervisory Patent Examiner
Technology Center 3700